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| 10/614,195 | 07/08/2003 | Yuzo Hirayama | 04329.3091 | 6325 |
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| FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER LLP 901 NEW YORK AVENUE, NW WASHINGTON, DC 20001-4413 | | | EXAMINER MOON, SEOKYUN | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/614,195

Applicant(s)

HIRAYAMA ET AL.

Examiner

SEOKYUN MOON

Art Unit

2629

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 April 2009.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7,9-11,17 and 18 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-7,9-11,17 and 18 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 08 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB-08)
Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Status of Claims

1. In the previous Office action mailed on December 11, 2008, claims 1-18 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Kobayashi (JP Pub. 2002-072135) in view of Yuji (JP Pub. 08-101367). In the amendments to the claims, the Applicant has amended claims 1 and 9 and canceled claims 8 and 12-16.

Response to Arguments

2. The Applicant's arguments filed on April 13, 2009 have been fully considered.

The Applicant argues [Remarks: pg 6 last three lines – pg 7 line 3] that both Kobayashi and Yuji are silent regarding assigning parallax information *"to each of the sub pixels in units of horizontally arranged sub pixels, the parallax information having a number of parallax differences that are not equal to whole-number multiples of a number of colors of sub pixels"*, as recited in the newly amended independent claim 1 and similarly recited in independent claim 9.

Prior to the discussion regarding the cited references, i.e. Kobayashi and Yuji, Examiner respectfully submits that the specification of the current Application does not support the newly added claim limitation, *"the parallax information having a number of parallax differences that are not equal to whole-number multiples of a number of colors of sub pixels"*. In the remarks, the Applicant explains [Remarks: pg 7 1st full paragraph], *"Furthermore, as illustrated in the non-limiting example shown in Fig. 8 of Applicant's*

specification, in the horizontal direction 10 parallaxes are given to three colors of R, G, and B, and in the vertical direction 5 parallaxes are given to the colors of R, G, and B. By virtue of this feature, sub pixels of adjacent pinholes (or lens) corresponding to the same parallax have different colors. In other words, the same color is prevented from being continuously observed. Accordingly, the claimed invention has the advantage of restricting color flicker. See, e.g., pg 14, lines 14-21". However, Examiner respectfully submits that the above explanation by the Applicant is about the arrangement of sub pixels having different colors, but is not related to the number of parallax differences, which is included in the newly added claim limitation and thus the Applicant's above explanation is not sufficient to support the newly added claim limitation. Furthermore, Examiner respectfully submits that the specification of the current Application does not define or disclose what the claimed "*parallax differences*" and "*whole-number multiples*" are. Accordingly, Examiner respectfully requests the Applicant to cite pages or figures of the specification of the current Application and explain how the specification supports the newly added claim limitation.

Regarding the cited references, as shown on figure 2 of Kobayashi, each of the display elements arranged on screen 11 corresponds to different parallax. Since the parallax of each of the display elements is determined based on the location of the observer, the number of parallax differences for each of the sub pixels are infinite based on the locations of the observer (Note that Examiner construed the parallax differences as the differences between the parallax at a location of the observer and the parallax at another location of the observer). Thus, Kobayashi teaches a number of parallax

differences are not equal to whole-number of multiples of a number of colors of sub pixels.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. **Claims 1-7, 9-11, and 17-18** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

As to **claims 1 and 9**, the claims disclose, "*the parallax information having a number of parallax differences that are not equal to whole-number multiples of a number of colors of sub pixels*".

However, Examiner respectfully submits that the original specification and the claims of the current Application does not define/disclose what the claimed "*parallax differences*" and "*whole-number multiples*" are.

Appropriate correction/explanation is required.

As to **claims 2-7, 10-11, and 17-18**, the claims are rejected as being dependent upon base claims rejected under 35 U.S.C. 112, first paragraph.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claims 1-7, 9-11, and 17-18** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi in view of Yuji.

As to **claim 1**, Kobayashi teaches a 3D image reproduction apparatus [abstract lines 1-2] comprising:

a display ("11") [drawing 2 and par. (0027)] including a screen on which a plurality of pixels (the display elements included on the "screen 14") are arranged to display synthesis parallax images in units of arrayed sub regions, and parallax information is assigned to each of the pixels in units of horizontally arranged pixels [drawing 2], the parallax information having a number of parallax differences that are not equal to whole-number multiples of a number of colors of pixels (as explained in the above "Response to Arguments" section); and

an optical system ("slit array", "pinhole array", or "micro-lens array 12") [drawing 2 and par. (0027)] arranged in front of the screen of the display, forming a 3D image by an integral photography system [par. (0030)] or a beam reproduction system from synthesis parallax images displayed on the screen in units of arrayed sub regions [par. (0029)], the optical system including a pinhole array ("pinhole array 12") [drawing 2 and

par. (0027)] or a microlens array in which pinholes or microlenses are arranged corresponding to the arrayed sub regions.

Kobayashi does not expressly teach each of the pixels including three sub pixels that differ in color.

However, Examiner takes official notice that it is well known in the art to use sub pixels having different colors to create a color image, instead of using pixels having different colors.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify each of the pixels of the display of Kobayashi to include three sub pixels that differ in color, in order to reduce the size of a display element capable of displaying any color, and thus to improve the resolution of the display (i.e. using three sub pixels to create a color instead of using three pixels).

Kobayashi as modified above does not expressly teach the sub pixels being laid out so that the adjacent sub pixels differ in color.

However, Yuji teaches an idea of arranging sub pixels on a screen of a 3D image reproduction apparatus [abstract], wherein adjacent sub pixels differ in color [drawings 1 and 2].

It would have been obvious to one of ordinary skill in the art at the time of the invention to replace the sub pixel arrangement of the screen of Kobayashi as modified above, with the sub pixel arrangement of the screen of Yuji, so that adjacent sub pixels differ in color, in order to provide uniform color distribution on the images to be displayed, and thus to prevent image degradation.

As to **claim 2**, Kobayashi as modified by Yuji teaches the synthesis parallax images [Kobayashi: pars. (0029) and (0030)] comprising images ray-traced in units of the sub pixels (Kobayashi: the device-user of the display of Kobayashi observes a three-dimensional image by tracing light rays backward from a viewing position to the light source).

As to **claim 3**, Kobayashi as modified by Yuji teaches the synthesis parallax images comprising images synthesized from a plurality of parallax images in units of the sub pixels [Kobayashi: pars. (0029) and (0030) and drawing 2].

As to **claim 4**, Kobayashi teaches the optical system comprising a pinhole array ("*pinhole array 12*") [drawing 2 and par. (0027)] in which pinholes are arranged corresponding to the arrayed sub regions.

As to **claim 5**, Kobayashi teaches the optical system comprising a slit array ("*slit array 12*") [drawing 2 and par. (0027)] in which slits are arranged corresponding to the arrayed sub regions.

As to **claim 6**, Kobayashi teaches the optical system comprising a micro-lens array ("*micro-lens array 12*") [drawing 2 and par. (0030)] in which micro-lenses are arranged corresponding to the arrayed sub regions.

As to **claim 7**, Kobayashi as modified by Yuji does not expressly teach the optical system comprising a lenticular sheet.

However, as the Examiner acknowledges that specifying the type of the optical system as one of a pinhole array, a slit array, a micro-lens array, and a lenticular sheet is not a required design specification, but is an option out of many alternative design

variations, it is an obvious matter of design choice to specify the type of the optical system as any one of a pinhole array, a slit array, a micro-lens array, or a lenticular sheet.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus of Kobayashi as modified by Yuji to use any one of a pinhole array, a slit array, a micro-lens array, and a lenticular sheet, as a component for the optical system of the apparatus, since any one of them would perform equally well at directing lights emitted from the screen to a viewer.

As to **claim 9**, all of the claim limitations have already been discussed with respect to the rejection of claims 1 and 5 except for the sub pixels having respectively rectangles and extending in a substantially vertical direction of the screen.

Kobayashi as modified by Yuji teaches the sub pixels having rectangles and extending in a substantially vertical direction of the screen [Yuji: drawing 2].

As to **claim 10**, all of the claim limitations have already been discussed with respect to the rejection of claim 2.

As to **claim 11**, all of the claim limitations have already been discussed with respect to the rejection of claim 3.

As to **claim 17**, Kobayashi as modified by Yuji teaches sub pixels of the same color being laid out in a diagonal pattern [Yuji: drawing 2].

As to **claim 18**, all of the claim limitations have already been discussed with respect to the rejection of claim 17.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to SEOKYUN MOON whose telephone number is (571)272-5552. The examiner can normally be reached on Mon - Fri (8:30 a.m. - 5:00 p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sumati Lefkowitz can be reached on (571) 272-3638. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

June 17, 2009
/S. M./
Examiner, Art Unit 2629

/Sumati Lefkowitz/
Supervisory Patent Examiner, Art Unit 2629